



Plant Archives

Journal homepage: <http://www.plantarchives.org>

DOI Url : <https://doi.org/10.51470/PLANTARCHIVES.2025.SP.ICTPAIRS-006>

IMPACT OF COMMUNITY RADIO ON PROMOTING RENEWABLE ENERGY SOLUTIONS FOR SUSTAINABLE AGRICULTURE

Foram Joshi* and Serene Shekhar

Department of Extension Education and Communication Management, ASPEE College of Nutrition and Community Science, Sardarkrushinagar Dantiwada Agricultural University, Dantiwada, Gujarat, India.

*Corresponding author E-mail : joshiforam7007@gmail.com

ABSTRACT

Community radio has emerged as a powerful tool for promoting renewable energy solutions and sustainable agricultural practices, particularly in rural areas where access to information is limited. This research explores the impact of community radio on enhancing awareness and adoption of renewable energy technologies among farmers, thereby contributing to sustainable agricultural development. Community radio stations serve as vital platforms for disseminating localized content tailored to the specific needs of their audiences. They facilitate interactive communication between farmers and experts, empowering communities to engage with renewable energy solutions such as solar power, which can significantly enhance agricultural productivity. For instance, community radio initiatives in regions like Bundelkhand, India, have successfully broadcast programs that educate farmers on sustainable practices and climate resilience, leading to improved agricultural outcomes. Moreover, community radio fosters a participatory approach that encourages farmers to share their experiences and challenges related to renewable energy adoption. By creating a dialogue around these issues, radio programs can effectively address misconceptions and provide practical solutions tailored to local contexts. The evidence from various studies indicates that farmers, who engage with community radio are more likely to adopt innovative practices and technologies that contribute to sustainability. Overall, community radio plays a crucial role in bridging the information gap in rural areas, promoting renewable energy solutions that align with sustainable agricultural practices. By leveraging local knowledge and fostering community engagement, these stations not only empower farmers but also contribute to broader environmental goals. Future research should focus on evaluating the long-term impacts of such initiatives on agricultural productivity and community resilience.

Key words : Renewable Energy, Community Radio, Sustainable Agriculture.

Introduction

The significance of renewable energy in agriculture cannot be overstated, especially as the sector faces increasing pressures from climate change and resource scarcity. Renewable energy technologies, such as solar, wind, and biogas, offer sustainable alternatives that can enhance agricultural productivity while minimizing environmental impact (Yusriadi, 2023; Komodromos, 2021). Community radio has emerged as a crucial medium for disseminating information in rural areas, where traditional communication channels may be limited. By providing localized content and fostering community engagement, community radio plays a pivotal role in rural

development and the promotion of renewable energy solutions (Mtega, 2021; Ankuyi *et al*, 2023) also, Community radio serves as a critical tool for bridging the information gap in rural areas, promoting renewable energy solutions that contribute to sustainable agricultural practices (Yusriadi, 2023). This review explores the intersection of community radio and renewable energy in the context of sustainable agriculture. Specifically, it examines how community radio can enhance awareness and adoption of renewable energy technologies among farmers. This review addresses the following research questions:

1. What role does community radio play in

disseminating information about renewable energy solutions?

2. How does community radio facilitate the adoption of sustainable agricultural practices?
3. What challenges do farmers face in accessing information about renewable energy, and how can community radio help overcome these barriers?

The Role of Community Radio in Rural Development

Community radio is defined as a non-profit, community-based broadcasting service that serves the interests of local populations (Yates *et al.*, 2022). Its unique features include participatory programming, local language broadcasts, and a focus on community issues, distinguishing it from commercial radio (Mutaqi *et al.*, 2023). Historically, community radio has evolved to address the need for local voices in the media landscape, particularly in rural areas where mainstream media often overlooks community concerns (Patel and Lepcha, 2023). Community radio has become a vital source of information on agricultural practices, health and local governance, thereby contributing to rural development (Ankuyi *et al.*, 2023; Lwoga, 2010). By fostering a sense of community ownership and participation, these stations empower local populations to engage with issues affecting their lives, including the adoption of renewable energy solutions (Hafida *et al.*, 2018).

Community Radio and Renewable Energy

The intersection of community radio and renewable energy encompasses a broader socio-economic landscape, including community empowerment, local governance, and sustainable development. As renewable energy technologies become increasingly vital in addressing climate change and promoting sustainable agricultural practices, the role of community radio in facilitating this transition cannot be overstated.

Community Empowerment through Renewable Energy initiatives

Community radio serves as a catalyst for empowerment by providing a platform for marginalized voices, particularly in rural areas. The integration of renewable energy initiatives into community radio programming enhances empowerment by informing communities about their rights and opportunities related to energy production and consumption. For example, Indigenous communities in Canada have utilized renewable energy projects to assert autonomy and self-determination, shaping an energy future aligned with their

cultural values (Stefanelli *et al.*, 2019). Such initiatives inspire similar movements in other regions, promoting local ownership and control over energy resources.

Technological Innovations and Community Radio

The advent of smart grids and microgrid systems presents new opportunities for community radio to engage with renewable energy solutions. As conventional grids evolve into intelligent systems, integrating information technologies enhances energy resource management (Vargas Salgado *et al.*, 2019). Community radio can play a crucial role in educating farmers and rural communities about these technologies, helping them leverage smart energy solutions for agricultural productivity. For instance, low-cost web-based supervisory control and data acquisition systems can empower communities to monitor and manage energy consumption effectively (Honda, 2021).

Socioeconomic Benefits of Community-Led Renewable Energy

Community-led renewable energy projects generate significant socioeconomic benefits, including job creation, income generation, and enhanced local governance (Sobczak, 2022). By promoting renewable energy initiatives, community radio contributes to local economic development and resilience. Small-scale renewable energy technologies, such as solar panels and wind turbines, provide communities with sustainable energy sources while creating local employment opportunities. Community radio can amplify these benefits by sharing success stories and best practices, encouraging other communities to adopt similar initiatives.

The role of Community Radio in Climate Change adaptation

As climate change poses significant challenges to agriculture, community radio promotes renewable energy solutions that enhance climate resilience. Broadcasting information about sustainable agricultural practices and renewable energy technologies helps farmers adapt to changing climatic conditions. For instance, community radio programs can educate farmers about solar-powered irrigation systems, which improve water management and crop yields in drought-prone areas.

Renewable Energy Solutions in Agriculture

Various renewable energy technologies are relevant to agriculture, including solar energy for irrigation, wind energy for powering equipment and biogas for organic waste management (Nakahara *et al.*, 2019). These technologies provide alternative energy sources while contributing to sustainable agricultural practices by

reducing reliance on fossil fuels and minimizing greenhouse gas emissions (Thomas *et al.*, 2020). Renewable energy in agriculture enhances economic resilience by reducing energy costs and increasing productivity. For example, solar-powered irrigation systems improve crop yields while conserving water resources, particularly in arid regions (Somanje *et al.*, 2021). Similarly, biogas systems convert agricultural waste into energy, providing farmers with a sustainable energy source and managing waste (Krishnan, 2023).

Impact of Community Radio on Awareness and Adoption

Community radio serves as an effective platform for disseminating information about renewable energy solutions to farmers. Through targeted programming, community radio educates farmers on the benefits and applications of renewable energy technologies (Silvestri *et al.*, 2020). For instance, in Bundelkhand, India, community radio initiatives successfully promoted solar energy adoption by providing practical advice and success stories (Blakney, 2023). Case studies show that farmers who engage with community radio are more likely to adopt innovative practices. Interactive communication allows farmers to ask questions, share experiences, and receive expert advice, thereby enhancing their understanding of renewable energy technologies (Agalo, 2023).

Case Studies

Radio Bundelkhand

Radio Bundelkhand in India exemplifies the effectiveness of community radio in promoting sustainable agriculture. Established in one of India's poorest regions, the station broadcasts programs that educate farmers about climate resilience and sustainable practices. These discussions on topics like organic farming and water conservation have led to improved agricultural outcomes (Ghosh and Kumar, 2020).

Promoting Renewable Energy Solutions

Community radio plays a crucial role in educating farmers about renewable energy technologies such as solar power. Broadcasting localized content that addresses misconceptions and provides practical solutions empowers farmers to adopt innovative practices. Programs discussing the benefits of solar energy for irrigation can significantly enhance agricultural productivity (van der Waal, 2020).

Successful Initiatives

In Zambia, community radio stations like Radio Kwenje have embraced solar energy to power their operations, reducing operational costs and enabling

reliable broadcasts despite electricity challenges. Interactive shows encourage community participation in discussions about renewable energy (Tembo, 2020).

Radio Kwenje, Zambia

Radio Kwenje is a community radio station that has integrated solar energy into its operations while focusing on agricultural education. Zambia faces energy shortages that impact communication; thus, using solar power allows for continuous broadcasting. The station produces programs that discuss sustainable farming techniques and the importance of renewable energy sources for irrigation systems.

Impact

- Increased awareness about solar energy applications among local farmers.
- Enhanced agricultural productivity due to better irrigation practices facilitated by solar technology.
- Strengthened community engagement around sustainability issues.

TANU e-Community Radio, India

TANU e-Community Radio is an initiative by Tamil Nadu Agricultural University aimed at providing agricultural information directly to farmers in rural areas. Farmers in Tamil Nadu often lack access to timely agricultural advice due to geographical barriers. The station broadcasts educational programs that cover various topics such as pest management, crop rotation, and organic farming techniques. It also integrates feedback from farmers to tailor content effectively (Kujur *et al.*, 2009).

Impact

- Increased knowledge among farmers regarding modern agricultural techniques.
- Enhanced communication between agricultural experts and local farmers.
- Improved adoption rates of sustainable practices like organic farming.

Challenges and Barriers

Despite its potential, several challenges hinder community radio's efforts to promote renewable energy solutions. Limited literacy and language barriers can impede effective communication, making it difficult for some farmers to engage with radio content (Lucas *et al.*, 2021). Additionally, misconceptions about renewable energy technologies, such as concerns over costs and reliability, lead to resistance among farmers (Wittwer *et al.*, 2021). Community radio plays a crucial role in addressing these misconceptions by providing accurate

information and dispelling myths surrounding renewable energy (Tambo *et al.*, 2019).

Participatory Approaches in Community Radio

Engagement strategies employed by community radio, such as call-in shows and participatory discussions, encourage farmers to actively participate in dialogues (Willems, 2013). These methods enhance the relevance of the content and empower farmers to share their experiences and challenges related to renewable energy adoption. Participatory approaches empower communities by providing them with the knowledge necessary to adopt renewable energy solutions, especially in rural areas where access to information is limited.

Conclusion

Community radio plays a vital role in promoting renewable energy solutions and sustainable agriculture, especially in rural areas where access to information is limited. By providing localized content and fostering community engagement, these stations empower farmers to adopt renewable energy technologies that enhance agricultural productivity and environmental sustainability. However, challenges remain and further research is needed to assess the long-term impact of community radio on renewable energy adoption and agricultural outcomes.

Future Directions and Recommendations

While community radio has demonstrated its potential, further research is needed to evaluate the long-term impacts of these initiatives on agricultural productivity and community resilience. Policy recommendations include increased support for community radio infrastructure and capacity-building programs to enhance content quality and reach. Collaborative efforts between governments, NGOs and community radio stations can further strengthen the role of community radio in promoting renewable energy solutions and sustainable agricultural practices (Chavez *et al.*, 2019).

References

- Agalo, A.O. (2023). Salience of community radio on climate change risks in rural Kenya: A case of Migori County. *Afr. Soc. Sci. Humanities J.*, **4(2)**, 180-198.
- Ahmed, Z. (2023). ICTs in smart agriculture: Paths to build SDGs of Bangladesh. *Asian J. Adv. Res. Rep.*, **17(8)**, 1-8. <https://doi.org/10.9734/ajarr/2023/v17i8500>
- Ankuyi, P., Asare A. and Amoah D. (2023). Local voices for cocoa production: Experiences of Ghanaian cocoa farmers on community radio. *Int. J. Food, Agric. Nat. Resources*, **4(1)**. <https://doi.org/10.46676/ijfanres.v4i1.126>
- Baumüller, H. (2017). The little we know: An exploratory literature review on the utility of mobile phone enabled services for smallholder farmers. *J. Int. Develop.*, **29(2)**, 211-230.
- Blakney, G.R., Cooper R.A. and Hunt W.D. (2023). Fertilisation of agricultural soils with municipal biosolids: Part 2. *Biorxiv*. <https://doi.org/10.1101/2023.12.14.571735>
- Hafida, E., Marhaeni D. and Fitri R. (2018). The effectiveness of community radio infrastructure to support disaster preparedness: Case study of community radio in Merapi volcano, Yogyakarta, Indonesia. *MATEC Web of Conferences*, **229**. <https://doi.org/10.1051/mateconf/201822904004>
- Honda, K. (2021). Energizing communities through partnerships with external actors: Small-scale hydropower projects in Japan. *J. Asian Rural Stud.*, **5(1)**, 43-57. <https://doi.org/10.20956/jars.v5i1.2656>
- Komodromos, M. (2021). Interactive radio, social network sites, and development in Africa: A literature review study. *J. Enterprising Communities: People and Places in the Global Economy*. <https://doi.org/10.1108/jec-06-2020-0111>
- Krishnan, V. (2023). The role of community radio in gender-based development. *Ciencia e Ingenieria*, **11(1)**, 150-160. <https://doi.org/10.52783/cienceng.v11i1.295>
- Kujur, G., Jha M.N., Chaudhary B.N., Kabdal D.C., Deepkumar V.S. and Singh R.C. (2009). Role of Community Radio in Promoting Agriculture in India. *Int. J. Res.*
- Lucas, M.T., Santos M.P. and Fernandes C. (2021). Improving public attitude towards renewable energy. *Energies*, **14(15)**, 4521. <https://doi.org/10.3390/en14154521>
- Lwoga, E.T. (2010). Bridging the agricultural knowledge and information divide: The case of selected telecenters and rural radio in Tanzania. *The Elect. J. Inform. Syst. Develop. Countries*, **43(6)**, 1-14.
- Makhura, M. and Chikozho C. (2018). The Role of Community Radio in Promoting Renewable Energy Solutions in Rural South Africa. *Renewable Energy Review*.
- Mtega, W.P. (2021). Communication channels for exchanging agricultural information among Tanzanian farmers: A meta-analysis. *IFLA J.* <https://doi.org/10.1177/03400352211023837>
- Mutaqi, R.A., Wardhana A.A. and Fauzi A. (2023). Cultural awareness of photovoltaic technologies in mosque communities in rural Java. *Research Square*. <https://doi.org/10.21203/rs.3.rs-3186508/v1>
- Nakahara, T., Kajikawa Y. and Yamamoto K. (2019). Discussion on regional revitalization using woody biomass resources as renewable energy. *Int. J. Energy Environ. Engg.*, **10(3)**, 243-254
- Nyareza, S. and Dick A. (2012). Use of community radio to communicate agricultural information to Zimbabwe's peasant farmers. *Aslib Proceedings*, **64(5)**, 494-508. <https://doi.org/10.1108/00012531211263111>
- Patel, A. and Lepcha T. (2023). Organic farming and sustainable agriculture: Harmonizing ecological conservation: The Lepcha Indigenous perspective. *Dogo Rangsang Res.*

- J., **13(3)**, 178-184. <https://doi.org/10.36893/drsr.2023.v13i03n05.178-184>
- Silvestri, S., Kristjanson P. and Waithanji E. (2020). Going digital in agriculture: How radio and SMS can scale-up smallholder participation in legume-based sustainable agricultural intensification practices and technologies in Tanzania. *Int. J. Agricult. Sust.*, **18(3)**, 315-329. <https://doi.org/10.1080/14735903.2020.1750796>
- Sobczak, J. and Sobczak M. (2022). Farmers' attitudes towards renewable energy sources. *Annals of the Polish Association of Agricultural*.
- Somanje, A., Kunda M. and Sikalinda M. (2020). Challenges and potential solutions for sustainable urban-rural linkages in a Ghanaian context. *Sustainability*, **12(2)**, 507.
- Somanje, A., Malambo L. and Mwaba P. (2021). Spatial distribution analysis of community radio stations for promoting climate change adaptation measures in agriculture under COVID-19 scenario, Southern Province, Zambia. *Research Square*. <https://doi.org/10.21203/rs.3.rs-1147966/v1>
- Stefanelli, A.M., Goudriaan D.K. and Lowan-Trudeau G. (2019). Renewable energy and energy autonomy: How Indigenous peoples in Canada are shaping an energy future. *Environ. Rev.*, **27(3)**, 365-379. <https://doi.org/10.1139/er-2018-0024>
- Tambo, J.A., Matimelo M. and Matope M. (2019). The impact of ICT-enabled extension campaign on farmers' knowledge and management of fall armyworm in Uganda. *PLOS ONE*, **14(8)**, e0220844. <https://doi.org/10.1371/journal.pone.0220844>
- Tembo, P. (2020). The Sounds of Solar: Powering Sustainable Community Radio in Africa. Internews.
- Thomas, L.M. and Kumar R. (2020). Accounting for the impact of sustainable agriculture: The role of community-based organizations and local governance structures in promoting sustainable agriculture. In : Kumar, R. (Ed.), *Sustainable Agriculture and Development* (pp. 200-220). IntechOpen. <https://doi.org/10.5772/intechopen.84385>
- Vargas Salgado, D., Fattahi A. and Shultz R. (2019). Low-cost web-based Supervisory Control and Data Acquisition system for a microgrid testbed: A case study in design and implementation for academic and research applications. *Heliyon*, **5(4)**, e02474. <https://doi.org/10.1016/j.heliyon.2019.e02474>
- Willems, W. (2013). Participation – In what? Radio, convergence and the corporate logic of audience input through new media in Zambia. *Telematics and Informatics*, **30(4)**, 250-260.
- Wittwer, R., Oehl F., van der Heijden M.G.A. and Jansa J. (2021). Organic and conservation agriculture promote ecosystem multifunctionality. *Science Advances*, **7(13)**.
- Yates, S.A., Hersh M.H., Ji Y. and Smith M.A. (2022). Rapid niche shifts in bacteria following conditioning in novel soil environments. *Functional Ecology*, **36(3)**, 635-646. <https://doi.org/10.1111/1365-2435.14180>